

February 12, 2013

Mr. Jason Gunter  
Remedial Project Manager  
U.S. Environmental Protection Agency  
Region 7 - Superfund Branch  
901 North 5<sup>th</sup> Street  
Kansas City, KS 66101

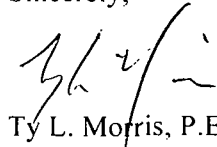
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SUPERFUND DIVISION

**Re: National Mine Tailings Site Progress Report**

Dear Mr. Gunter:

As required by Article VI, Section 51 of the Unilateral Administrative Order (Docket No. CERCLA-07-2006-0231) for the referenced project and on behalf of The Doe Run Company and NL Industries, Inc., the progress report for the period January 1, 2013 through January 31, 2013 is enclosed. If you have any questions or comments, please call me at 573-638-5020 or Mark Nations at 573-518-0800.

Sincerely,



Ty L. Morris, P.E., R.G.  
Vice President

TLM/jms  
Enclosure

c: Mark Nations – TDRC  
Matt Wohl – TDRC (electronic only)  
Kevin Lombardozzi – NL Industries, Inc.  
John Kennedy – City of Park Hills  
Norm Lucas – Park Hills – Leadington Chamber of Commerce  
Kathy Rangen – MDNR  
Tim Skoglund – Barr Engineering

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**National Mine Tailings Site**  
Park Hills, Missouri  
**Removal Action - Monthly Progress Report**  
Period: January 1, 2013 – January 31, 2012

**1. Actions Performed and Problems Encountered This Period:**

- a. Work continued on the development of the removal action report.

**2. Analytical Data and Results Received This Period:**

- a. During this period, water samples were collected at the sampling locations identified in Appendix C of the Removal Action Work Plan where water was present. Copies of the analytical results from the last sampling event are included with this progress report.
- b. During this period, the Ambient Air Monitoring Report for Third Quarter 2012 and October 2012 were completed. Any issues identified in these reports are discussed below. A copy of these documents has been sent to your attention.

The Third Quarter 2012 Ambient Air Monitoring Report noted the following:

- The action levels for lead and dust were not exceeded.
- No samples were taken with the National #3 (Water Plant) TSP monitor on 07/02/12 due to mechanical failure. Upon discovery, the issue was corrected.
- No samples were taken with the TSP monitors on 07/04/12 due to the holiday.
- No samples were taken with the National #1 (Ozark) TSP monitor on 08/23/12 due to mechanical failure. Upon discovery, the issue was corrected.
- No samples were taken with the TSP and PM<sub>10</sub> monitors on 09/03/12 due to the holiday.
- No samples were taken with the National #2 (Soccer Field) TSP monitor on 09/21/12 due to mechanical failure. Upon discovery, the issue was corrected.
- No samples were taken with the Big River #4 (Primary) PM<sub>10</sub> monitor on 09/21/12 due to mechanical failure. Upon discovery, the issue was corrected.

The October 2012 Ambient Air Monitoring Report noted the following:

- The action levels for lead and dust were not exceeded.
- No sample was taken with the Big River #4 (Primary) PM<sub>10</sub> monitor on 10/09/12 due to mechanical failure of the elapsed time indicator. Upon discovery, the issue was corrected.

**3. Developments Anticipated and Work Scheduled for Next Period:**

- a. Complete work in the Mine Shaft Area.
- b. Continue developing the Removal Action Report.
- c. Complete monthly water sampling activities as described in the Removal Action Work Plan.
- d. Complete air monitoring activities as described in the Removal Action Work Plan.

**4. Changes in Personnel:**

- a. None.

**5. Issues or Problems Arising This Period:**

- a. None.

**6. Resolution of Issues or Problems Arising This Period:**

- a. None.

**End of Monthly Progress Report**

January 16, 2013

Allison Olds  
Barr Engineering Company  
1001 Diamond Ridge  
Suite 1100  
Jefferson City, MO 65109  
TEL: (573) 638-5007  
FAX: (573) 638-5001



**RE:** National Tailings Pile - Design and Construction

**WorkOrder:** 13010448

Dear Allison Olds:

TEKLAB, INC received 1 sample on 1/10/2013 11:27:00 AM for the analysis presented in the following report.

Samples are analyzed on an as received basis unless otherwise requested and documented. The sample results contained in this report relate only to the requested analytes of interest as directed on the chain of custody. NELAP accredited fields of testing are indicated by the letters NELAP under the Certification column. Unless otherwise documented within this report, Teklab Inc. analyzes samples utilizing the most current methods in compliance with 40CFR. All tests are performed in the Collinsville, IL laboratory unless otherwise noted in the Case Narrative.

All quality control criteria applicable to the test methods employed for this project have been satisfactorily met and are in accordance with NELAP except where noted. The following report shall not be reproduced, except in full, without the written approval of Teklab, Inc.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,



Michael L. Austin  
Project Manager  
(618)344-1004 ex 16  
MAustin@teklabinc.com



## Report Contents

<http://www.teklabinc.com/>

**Client:** Barr Engineering Company

**Work Order:** 13010448

**Client Project:** National Tailings Pile - Design and Construction

**Report Date:** 16-Jan-13

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## Definitions

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13010448

Client Project: National Tailings Pile - Design and Construction

Report Date: 16-Jan-13

### Abbr Definition

- CCV Continuing calibration verification is a check of a standard to determine the state of calibration of an instrument between recalibration.
- DF Dilution factor is the dilution performed during analysis only and does not take into account any dilutions made during sample preparation. The reported result is final and includes all dilutions factors.
- DNI Did not ignite
- DUP Laboratory duplicate is an aliquot of a sample taken from the same container under laboratory conditions for independent processing and analysis independently of the original aliquot.
- ICV Initial calibration verification is a check of a standard to determine the state of calibration of an instrument before sample analysis is initiated.
- IDPH IL Dept. of Public Health
- LCS Laboratory control sample, spiked with verified known amounts of analytes, is analyzed exactly like a sample to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system. The acceptable recovery range is in the QC Package (provided upon request).
- LCSD Laboratory control sample duplicate is a replicate laboratory control sample that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
- MB Method blank is a sample of a matrix similar to the batch of associated sample (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences should present at concentrations that impact the analytical results for sample analyses.
- MDL Method detection limit means the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.
- MS Matrix spike is an aliquot of matrix fortified (spiked) with known quantities of specific analytes that is subjected to the entire analytical procedures in order to determine the effect of the matrix on an approved test method's recovery system. The acceptable recovery range is listed in the QC Package (provided upon request).
- MSD Matrix spike duplicate means a replicate matrix spike that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
- MW Molecular weight
- ND Not Detected at the Reporting Limit
- NELAP NELAP Accredited
- PQL Practical quantitation limit means the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operation conditions. The acceptable recovery range is listed in the QC Package (provided upon request).
- RL The reporting limit the lowest level that the data is displayed in the final report. The reporting limit may vary according to customer request or sample dilution. The reporting limit may not be less than the MDL.
- RPD Relative percent difference is a calculated difference between two recoveries (ie. MS/MSD). The acceptable recovery limit is listed in the QC Package (provided upon request).
- SPK The spike is a known mass of target analyte added to a blank sample or sub-sample; used to determine recovery deficiency or for other quality control purposes.
- Surr Surrogates are compounds which are similar to the analytes of interest in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.
- TNTC Too numerous to count ( > 200 CFU )

### Qualifiers

- |  |   |
|--|---|
| # - Unknown hydrocarbon                                | B - Analyte detected in associated Method Blank |
| E - Value above quantitation range                     | H - Holding times exceeded                      |
| M - Manual Integration used to determine area response | ND - Not Detected at the Reporting Limit        |
| R - RPD outside accepted recovery limits               | S - Spike Recovery outside recovery limits      |
| X - Value exceeds Maximum Contaminant Level            |   |



## Case Narrative

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13010448

Client Project: National Tailings Pile - Design and Construction

Report Date: 16-Jan-13

Cooler Receipt Temp: 1.2 °C

### Locations and Accreditations

Collinsville		Springfield		Kansas City	
Address	5445 Horseshoe Lake Road Collinsville, IL 62234-7425	Address	3920 Pintail Dr Springfield, IL 62711-9415	Address	8421 Nieman Road Lenexa, KS 66214
Phone	(618) 344-1004	Phone	(217) 698-1004	Phone	(913) 541-1998
Fax	(618) 344-1005	Fax	(217) 698-1005	Fax	(913) 541-1998
Email	jhriley@teklabinc.com	Email	KKlostermann@teklabinc.com	Email	dthompson@teklabinc.com

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2014	Collinsville
Kansas	KDHE	E-10374	NELAP	1/31/2013	Collinsville
Louisiana	LDEQ	166493	NELAP	6/30/2013	Collinsville
Louisiana	LDEQ	166578	NELAP	6/30/2013	Springfield
Texas	TCEQ	T104704515-12-1	NELAP	7/31/2013	Collinsville
Arkansas	ADEQ	88-0966		3/14/2013	Collinsville
Illinois	IDPH	17584		4/30/2013	Collinsville
Kentucky	UST	0073		5/26/2013	Collinsville
Missouri	MDNR	00930		4/13/2013	Collinsville
Oklahoma	ODEQ	9978		8/31/2013	Collinsville



## Laboratory Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13010448

Client Project: National Tailings Pile - Design and Construction

Report Date: 16-Jan-13

Lab ID: 13010448-001

Client Sample ID: Nat-East

Matrix: AQUEOUS

Collection Date: 01/09/2013 11:50

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
<b>EPA 600 375.2 REV 2.0 1993 (TOTAL)</b>								
Sulfate	NELAP	100	S	231	mg/L	10	01/15/2013 18:09	R172656
<i>MS and/or MSD did not recover within control limits due to matrix interference.</i>								
<b>STANDARD METHOD 4500-H B, LABORATORY ANALYZED</b>								
Lab pH	NELAP	1.00		8.31		1	01/10/2013 13:04	R172448
<b>STANDARD METHODS 2340 C</b>								
Hardness, as ( CaCO <sub>3</sub> )	NELAP	5		500	mg/L	1	01/10/2013 13:12	R172464
<b>STANDARD METHODS 2540 C (TOTAL)</b>								
Total Dissolved Solids	NELAP	20		632	mg/L	1	01/14/2013 19:04	R172623
<b>STANDARD METHODS 2540 D</b>								
Total Suspended Solids	NELAP	6		< 6	mg/L	1	01/10/2013 15:37	R172466
<b>STANDARD METHODS 2540 F</b>								
Solids, Settleable	NELAP	0.1		< 0.1	ml/L	1	01/10/2013 13:22	R172471
<b>STANDARD METHODS 5310 C, ORGANIC CARBON</b>								
Total Organic Carbon (TOC)	NELAP	1.0		1.3	mg/L	1	01/11/2013 16:43	R172542
<b>EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)</b>								
Cadmium	NELAP	2.00		< 2.00	µg/L	1	01/11/2013 12:08	84837
Zinc	NELAP	10.0		135	µg/L	1	01/11/2013 12:08	84837
<b>EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)</b>								
Cadmium	NELAP	2.00		< 2.00	µg/L	1	01/11/2013 15:15	84836
Zinc	NELAP	10.0		145	µg/L	1	01/11/2013 15:15	84836
<b>STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA</b>								
Lead	NELAP	2.00	X	6.27	µg/L	1	01/11/2013 9:16	84827
<b>STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)</b>								
Lead	NELAP	2.00	X	5.16	µg/L	1	01/11/2013 12:48	84838



## Sample Summary

<http://www.teklabinc.com/>

**Client:** Barr Engineering Company

**Work Order:** 13010448

**Client Project:** National Tailings Pile - Design and Construction

**Report Date:** 16-Jan-13

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Lab Sample ID	Client Sample ID	Matrix	Fractions	Collection Date
13010448-001	Nat-East	Aqueous	5	01/09/2013 11:50

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## Dates Report

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13010448

Client Project: National Tailings Pile - Design and Construction

Report Date: 16-Jan-13

Sample ID	Client Sample ID Test Name	Collection Date	Received Date	Prep Date/Time	Analysis Date/Time
13010448-001A	Nat-East Standard Methods 2540 F	01/09/2013 11:50	01/10/2013 11:27		01/10/2013 13:22
13010448-001B	Nat-East EPA 600 375.2 Rev 2.0 1993 (Total) Standard Method 4500-H B, Laboratory Analyzed Standard Methods 2340 C Standard Methods 2540 C (Total) Standard Methods 2540 D	01/09/2013 11:50	01/10/2013 11:27		01/15/2013 18:09 01/10/2013 13:04 01/10/2013 13:12 01/14/2013 19:04 01/10/2013 15:37
13010448-001C	Nat-East EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total) Standard Methods 3030 E, 3113 B, Metals by GFAA	01/09/2013 11:50	01/10/2013 11:27	01/10/2013 17:58 01/10/2013 14:57	01/11/2013 15:15 01/11/2013 9:16
13010448-001D	Nat-East EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved) Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)	01/09/2013 11:50	01/10/2013 11:27	01/10/2013 18:29 01/10/2013 19:28	01/11/2013 12:08 01/11/2013 12:48
13010448-001E	Nat-East Standard Methods 5310 C, Organic Carbon	01/09/2013 11:50	01/10/2013 11:27		01/11/2013 16:43



## Quality Control Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13010448

Client Project: National Tailings Pile - Design and Construction

Report Date: 16-Jan-13

### EPA 600 375.2 REV 2.0 1993 (TOTAL)

Batch R172601		SampType: MBLK		Units mg/L							
SampID: MBLK											Date
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed	
Sulfate		10		< 10						01/14/2013	

Batch R172601		SampType: LCS		Units mg/L						
SampID: LCS										
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		20	20	0	100.0	90	110	01/14/2013

Batch R172656		SampType: MBLK		Units mg/L						
SampID: MBLK										
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		< 10						01/15/2013

Batch R172656		SampType: LCS		Units mg/L						
SampID: LCS										
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		10		21	20	0	105.0	90	110	01/15/2013

Batch R172656		SampType: MS		Units mg/L						
SampID: 13010448-001BMS										
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate		100		325	100	231.2	93.8	90	110	01/15/2013

Batch R172656		SampType: MSD		Units mg/L				RPD Limit 10		
SampID: 13010448-001BMSD										
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Sulfate		100	S	348	100	231.2	117.2	325.0	6.95	01/15/2013

### STANDARD METHOD 4500-H B, LABORATORY ANALYZED

Batch R172448		SampType: LCS		Units						
SampID: LCS										
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lab pH		1.00		7.03	7.00	0	100.4	99.1	100.8	01/10/2013

Batch R172448		SampType: DUP		Units				RPD Limit 10			
SampID: 13010448-001BDUP										Date Analyzed	
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD		
Lab pH		1.00		8.39				8.310	0.96	01/10/2013	



## Quality Control Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13010448

Client Project: National Tailings Pile - Design and Construction

Report Date: 16-Jan-13

### STANDARD METHODS 2340 C

Batch R172464 SampType: MBLK		Units mg/L								Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Hardness, as ( CaCO <sub>3</sub> )		5		< 5						01/10/2013

Batch R172464 SampType: LCS		Units mg/L								Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Hardness, as ( CaCO <sub>3</sub> )		5		980	1000	0	98.0	90	110	01/10/2013

Batch R172464 SampType: MS		Units mg/L								Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Hardness, as ( CaCO <sub>3</sub> )		5		690	200	500.0	95.0	85	115	01/10/2013

Batch R172464 SampType: MSD		Units mg/L								RPD Limit 10	Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD		
Hardness, as ( CaCO <sub>3</sub> )		5		700	200	500.0	100.0	690.0	1.44		01/10/2013

### STANDARD METHODS 2540 C (TOTAL)

Batch R172623 SampType: MBLK		Units mg/L								Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Total Dissolved Solids		20		< 20						01/14/2013
Total Dissolved Solids		20		< 20						01/14/2013

Batch R172623 SampType: LCS		Units mg/L								Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Total Dissolved Solids		20		1040	1000	0	104.4	90	110	01/14/2013

Batch R172623 SampType: LCSQC		Units mg/L								Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Total Dissolved Solids		20		1050	1000	0	105.2	90	110	01/14/2013

Batch R172623 SampType: MS		Units mg/L								Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Total Dissolved Solids		20		1150	500	632.0	104.0	85	115	01/14/2013



## Quality Control Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13010448

Client Project: National Tailings Pile - Design and Construction

Report Date: 16-Jan-13

### STANDARD METHODS 2540 C (TOTAL)

Batch R172623		SampType: MSD		Units mg/L				RPD Limit 15		
SampID: 13010448-001BMSD										Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	
Total Dissolved Solids		20		1160	500	632.0	105.6	1152	0.69	01/14/2013

### STANDARD METHODS 2540 D

Batch R172466		SampType: MBLK		Units mg/L						
SampID: MBLK										Date
Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed	
Total Suspended Solids	6		< 6						01/10/2013	

Batch R172466		SampType: LCS		Units mg/L						
SampID: LCS										Date
Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed	
Total Suspended Solids	6		88	100	0	88.0	85	115	01/10/2013	
Total Suspended Solids	6		92	100	0	92.0	85	115	01/10/2013	
Total Suspended Solids	6		102	100	0	102.0	85	115	01/10/2013	
Total Suspended Solids	6		107	100	0	107.0	85	115	01/10/2013	

Batch R172466		SampType: DUP		Units mg/L				RPD Limit 15		
SampID: 13010448-001B DUP									Date Analyzed	
Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD		
Total Suspended Solids	6		< 6				0	0.00	01/10/2013	

### STANDARD METHODS 5310 C, ORGANIC CARBON

Batch R172542		SampType: MBLK		Units mg/L						
SampID: ICB/MBLK										Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Total Organic Carbon (TOC)		1.0		< 1.0						01/11/2013

Batch R172542		SampType: LCS		Units mg/L						
SampID: ICB/LCS										Date
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Total Organic Carbon (TOC)		10.0		61.0	59.7	0	102.1	90	110	01/11/2013

Batch R172542		SampType: MS		Units mg/L					
SampID: 13010448-001EMS									
Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Organic Carbon (TOC)	1.0		5.8	5.0	1.260	90.8	85	115	01/11/2013

Batch R172542		SampType: MSD		Units mg/L				RPD Limit 10		
SampID: 13010448-001EMSD										Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	
Total Organic Carbon (TOC)		1.0		5.7	5.0	1.260	89.0	5.800	1.56	01/11/2013



## Quality Control Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13010448

Client Project: National Tailings Pile - Design and Construction

Report Date: 16-Jan-13

### EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)

Batch 84837		SampType: MBLK		Units µg/L						Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Cadmium		2.00		< 2.00	2.00	0	0	-100	100	01/11/2013
Zinc		10.0		< 10.0	10.0	0	0	-100	100	01/11/2013

Batch 84837		SampType: LCS		Units µg/L						Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Cadmium		2.00		44.2	50.0	0	88.4	85	115	01/11/2013
Zinc		10.0		446	500	0	89.1	85	115	01/11/2013

Batch 84837		SampType: MS		Units µg/L						Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Cadmium		2.00		43.2	50.0	0	86.4	75	125	01/11/2013
Zinc		10.0		568	500	134.6	86.7	75	125	01/11/2013

Batch 84837		SampType: MSD		Units µg/L						RPD Limit 20	Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD		
Cadmium		2.00		43.3	50.0	0	86.6	43.2	0.23		01/11/2013
Zinc		10.0		572	500	134.6	87.4	568.1	0.61		01/11/2013

### EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)

Batch 84836		SampType: MBLK		Units µg/L						Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Cadmium		2.00		< 2.00	2.00	0	0	-100	100	01/11/2013
Zinc		10.0		< 10.0	10.0	0	0	-100	100	01/11/2013

Batch 84836		SampType: LCS		Units µg/L						Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Cadmium		2.00		47.3	50.0	0	94.6	85	115	01/11/2013
Zinc		10.0		481	500	0	96.2	85	115	01/11/2013

Batch 84836		SampType: MS		Units µg/L						Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Cadmium		2.00		45.5	50.0	0.4	90.2	75	125	01/11/2013
Zinc		10.0		609	500	145.1	92.7	75	125	01/11/2013





## Quality Control Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13010448

Client Project: National Tailings Pile - Design and Construction

Report Date: 16-Jan-13

### EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)

Batch 84836		SampType: MSD		Units µg/L		RPD Limit 20				Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	
Cadmium		2.00		45.7	50.0	0.4	90.6	45.5	0.44	01/11/2013
Zinc		10.0		609	500	145.1	92.7	608.7	0.00	01/11/2013

### STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA

Batch 84827		SampType: MBLK		Units µg/L						Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Lead		2.00		< 2.00	2.00	0	0	-100	100	01/11/2013

Batch 84827		SampType: LCS		Units µg/L						Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Lead		2.00		14.8	15.0	0	98.9	85	115	01/11/2013

Batch 84827		SampType: MS		Units µg/L						Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Lead		2.00		20.8	15.0	6.2688	96.6	70	130	01/11/2013

Batch 84827		SampType: MSD		Units µg/L		RPD Limit 20				Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	
Lead		2.00		20.7	15.0	6.2688	95.9	20.7662	0.54	01/11/2013

### STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)

Batch 84838		SampType: MBLK		Units µg/L						Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Lead		2.00		< 2.00	2.00	0	0	-100	100	01/11/2013

Batch 84838		SampType: LCS		Units µg/L						Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Lead		2.00		13.9	15.0	0	92.8	85	115	01/11/2013

Batch 84838		SampType: MS		Units µg/L						Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Lead		2.00		18.3	15.0	5.1593	87.7	70	130	01/11/2013



## Quality Control Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 13010448

Client Project: National Tailings Pile - Design and Construction

Report Date: 16-Jan-13

### STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)

Batch 84838	SampType: MSD	Units µg/L						RPD Limit 20		
SampID: 13010448-001DMSD										Date
Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Analyzed	
Lead	2.00		17.9	15.0	5.1593	84.6	18.317	2.56	01/11/2013	



## Receiving Check List

<http://www.teklabinc.com>

Client: Barr Engineering Company

Work Order: 13010448

Client Project: National Tailings Pile - Design and Construction

Report Date: 16-Jan-13

Carrier: Neil Talbott

Received By: SRH

Completed by:

On:

10-Jan-13

Timothy W. Mathis

Reviewed by:

On:

10-Jan-13

Michael L. Austin

Pages to follow: Chain of custody

1

Extra pages included

0

Shipping container/cooler in good condition?

Yes ☒

No ☐

Not Present ☐

Temp °C 1.2

Type of thermal preservation?

None ☐

Ice ☒

Blue Ice ☐

Dry Ice ☐

Chain of custody present?

Yes ☒

No ☐

Chain of custody signed when relinquished and received?

Yes ☒

No ☐

Chain of custody agrees with sample labels?

Yes ☒

No ☐

Samples in proper container/bottle?

Yes ☒

No ☐

Sample containers intact?

Yes ☒

No ☐

Sufficient sample volume for indicated test?

Yes ☒

No ☐

All samples received within holding time?

Yes ☒

No ☐

Reported field parameters measured:

Field ☐

Lab ☒

NA ☐

Container/Temp Blank temperature in compliance?

Yes ☒

No ☐

When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.

Water - at least one vial per sample has zero headspace?

Yes ☐

No ☐

No VOA vials ☒

Water - TOX containers have zero headspace?

Yes ☐

No ☐

No TOX containers ☒

Water - pH acceptable upon receipt?

Yes ☒

No ☐

NPDES/CWA TCN interferences checked/treated in the field?

Yes ☐

No ☐

NA ☒

Any No responses must be detailed below or on the COC.





### Chain of Custody

1001 Diamond Ridge, Suite 1100  
Jefferson City, MO 65109  
(573) 638-5000

Project Number: 25860003.06 TLM2 030

Project Name: National Tailings Pile - Design and Construction

Sample Origination State: MO (use two letter postal state abbreviation)

COC Number: NAT 010913

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix		Type		pH	Total Suspended Solids	Sulfate	Settleable Solids	Total Organic Carbon	Total Metals	Dissolved Metals	Hardness	Total Dissolved Solids	Total Number of Containers	Preservatives: 2 HNO3, 1 H2SO4, 2 Unpreserved
						Water	Soil	Grab	Comp											
1. <u>13010448</u> Nat-East 001				01/09/13	11:50	X		X			X	X	X	X	X	X	X	X	5	
2.																				
3.																				
4.																				
5.																				
6.																				
7.																				
8.																				

Comments: Invoice to Mark Nations at Doe Run. Results to be sent to Allison Olds (aolds@barr.com) at Barr Engineering, Andrea Nord (anord@barr.com) at Barr Engineering, and Mark Nations (mnations@doerun.com) at Doe Run.  
Matrix is surface water.  
Metals include Cadmium, Lead, and Zinc.

#### Common Parameter/Container - Preservation Key

#1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List

#2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide, PCBs

#3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate

#4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By: Stephen Moilanen	On Ice? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Date: 1-9-13	Time: 14:30	Received by: <i>[Signature]</i>	Date: 1/9/13	Time: 10:00
Relinquished By: <i>[Signature]</i>	On Ice? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Date: 1/10/13	Time: 11:27	Received by: <i>[Signature]</i>	Date: 1/10/13	Time: 11:27 AM
Samples Shipped VIA: <input type="checkbox"/> Air Freight <input type="checkbox"/> Federal Express <input type="checkbox"/> Sampler <input checked="" type="checkbox"/> Other: <u>Courier Pick Up</u>				Air Bill Number: <u>1-2 ICE PRES JTM 1-10-13</u>		

Distribution: White - Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator